DEPARTMENT OF FOOD AND AGRICULTURE
PROPOSED AMENDMENT OF THE REGULATIONS

Title 4, Division 9, Chapter 1
Sections 4027 through 4027.5

Article 2.2.
ELECTRIC WATTHOUR METERS

INITIAL STATEMENT OF REASONS

Background

The overall mission of weights and measures is to preserve and maintain the standards of measurement essential in providing a basis of value comparison for the consumer and fair competition for industry. The principal task of weights and measures is to minimize measurement error in commercial transactions through the establishment and enforcement of standards that can be uniformly applied in the exchange of goods and services. Adherences to these standards provide both buyer and seller an assurance of equity that is the foundation of an efficient and free market economy. An effective measurement program directly benefits all citizens of the State.

Mechanical watthour meters have been used for measuring electricity since the early 1900s. Watthour meters are used in submeter applications in apartment complexes, marinas, and other applications throughout California. The existing watthour meter code does not address specific differences between mechanical and electronic watthour meters.

The Legislature has charged the Department of Food and Agriculture with the responsibility of supervising weights and measures activities within California (Business and Professions Code, Division 5, Section 12100). The Secretary of the Department of Food and Agriculture is granted the authority to adopt such regulations as are reasonably necessary to carry out the provisions of the Business and Professions Code, Division 5, Section 12027.

Description of the Public Problem, Administrative Requirements, or other Conditions or Circumstances the Regulations are Intended to Address

Section 12107 of the Business and Professions Code gives the Secretary the authority to establish tolerances and specifications for commercial weighing and measuring devices not included in the National Institute of Standards and Technology Handbook 44.

Requirements for watthour meters are not included in Handbook 44. Tolerances, specifications, and other technical requirements for mechanical watthour meters have previously been established in the California Code of Regulations, Title 4, Division 9,

Chapter 1, Article 2.2., Electric Watthour Meters. However, the technology for watthour meters has evolved to include electronic watthour meters which are not recognized in the existing regulation.

Specific Purpose and Factual Basis

The Department of Food and Agriculture proposes to repeal Article 2.2., Electric Watthour Meters, and adopt a new Article 2.2, Electric Watthour Meters, to recognize electronic watthour meters and include mechanical watthour meters with appropriate tolerances and specifications based on:

California Code of Regulations, Title 4, Division 9, Chapter 1, Article 2.2., Electric Watthour Meters.

American National Standard for Electricity Metering, ANSI C12.1- 2001

American National Standard for Electricity Metering, ANSI C12.10-1997

National Electrical Manufacturers Association, NEMA EI 21.1-1993

Handbook for Electricity Metering, ninth edition

SECTION 4027. A. APPLICATION. This section specifies that this code applies to the newer technology electronic watthour meters as well as to conventional type mechanical watthour meters. Specific section numbers are added to clarify the reference to General Code requirements. Additionally, clarification is provided to indicate when requirements apply only to electronic or mechanical watthour meters.

SECTION 4027.1. DEFINITIONS. This section defines terms used in Article 2.2., that have special meaning as used in this code section. The definitions are necessary to provide inspectors, manufacturers, installers, users, and service agents with clear meanings of the terms that are used to describe specifications, testing procedures, tolerances, and user requirements.

SECTION 4027.2. S. SPECIFICATIONS. This section makes clear and specific the specification requirements for meter manufacturers, service agents, and installers of electronic and mechanical watthour meters.

This section incorporates parts of the specification requirements existing in the current California Code of Regulations, Title 4, Division 9, Chapter 1, Article 2.2., Electric Watthour Meters; the American National Standard Code for Electricity Metering, ANSI C12.1-2001 edition; American National Standard for Electricity Metering, ANSI C12.10-1997 edition for watthour meters; National Electrical Manufacturers Association, NEMA EI 21.1-1993 edition; and Handbook for Electricity Metering, ninth edition.

S.1. Metrological Components. This section specifies how a meter system shall be designed and constructed.

S.2. Terminals. This section applies to the arrangement of the terminals in order to minimize the possibility of short circuits.

S.3. Enclosures. This section states that the enclosures must be designed to facilitate connecting test equipment, observing active meter readings, and/or test constant output indications.

S.4. Provision for Sealing.

S.4.1. Sealing. This subsection states the manner in which a security seal shall be applied.

Table S.4.1. Categories of Device and Methods of Sealing. This table details the format requirements for the audit trail.

S.5. Meter Identification and Marking Requirements. This section specifies identification and marking requirements that are in addition to the requirements of Section 1.10. G-S.1.

S.6. Abbreviations and Symbols. This section specifies the abbreviations and symbols that may appear on a meter, instrument transformer, or indicator.

S.7. Instrument Transformer.

S.7.1. Identification. This subsection specifies the permanent identification label information required for each instrument transformer that is non-integral with the meter.

S.7.2 Accuracy Class. This subsection lists the accuracy class for an instrument transformer that is not an integral part of the meter and is used for revenue metering.

S.7.3. Polarity Marking. This subsection states that a permanent mark is required that indicates proper installation orientation on the instrument transformer when the accuracy of the meter is affected.

S.8. (MM) Meter Register. This section states that mechanical meter registers shall clearly indicate the number of kilowatthours that are measured, that the register ratio shall be indicated on the front of the registers that are not an integral part of the meter nameplate, and that a means shall be provided for the tenant to read the meter register.

S.9. (EM) Meter Watthour Display. This section specifies required information to be displayed by all electronic meters for submeters in a service system.

S.10. Multiple Meter Indicating Elements. This section states what must be provided on an indicating or combination indicating-recording element coupled to two or more meter systems.

S.11. (EM) Meter-Control Program. This section states that on electronic meters the meter control program is an integral part of the meter's firmware read-only memory that cannot be changed in its operating environment.

S.12. (EM) Data Storage and Retrieval. This section specifies requirements for electronic meter data storage and retrieval.

S.13. Temperature Range for Metering Components. This section states over what temperature range the meter and/or components must be accurate and correct and that if they are not capable of meeting these requirements, then the installations shall be limited to the temperature limits stated on the meter.

SECTION 4027.3. N. NOTES. This section incorporates the testing notes existing in the current California Code of Regulations, Title 4, Division 9, Chapter 1, Article 2.2., the American National Standard Code for Electricity Metering, ANSI C12.1-2001 edition; American National Standard for Electricity Metering, ANSI C12.10-1997 edition for watthour meters; National Electrical Manufacturers Association, NEMA EI 21.1-1993 edition; and Handbook for Electricity Metering, ninth edition. This section also defines, explains, and makes specific procedures applicable to meter tests. By defining tests and explaining the conditions of the test, manufacturers, service agents, and inspectors can duplicate the testing for compliance requirements.

N.1. Meter Creep Test. Conditions of the meter creep test are stated in this paragraph to provide inspectors with clear test parameters to ensure that meters do not register under no load conditions.

N.2. Meter Starting Load. The meter starting load test of 0.5 amperes is stated in this paragraph.

N.3. Meter Test Constant Output Indications. This section specifies the meter constant output indications for full and light load tests and requires that test standards that read out directly in watthours shall meet a specified watthour equivalent.

N.4. Meter and System Test Loads. Subsections (a) and (b) list the meter and system test loads for mechanical meters and subsection (c) lists the meter and system test loads for electronic meters.

N.5. Test of a Meter System. This section states that meters submitted for test shall be complete systems, the test loads to be applied, and the rated voltage variance for tests.

SECTION 4027.4. T. TOLERANCES. This section incorporates the tolerance requirements existing in the current California Code of Regulations, Title 4, Division 9, Chapter 1, Article 2.2., Electric Watthour Meters; the American National Standard Code for Electricity Metering, ANSI C12.1-2001 edition; and the American Standard for Electricity Metering, ANSI C12.10-1997 edition for watthour meters. It states the limits of inaccuracy permitted before the meter is required to be removed from service due to inaccuracies.

SECTION 4027.5 UR. USER REQUIREMENTS. This section incorporates the user requirements found in existing California Code of Regulations, Title 4, Division 9, Chapter 1, Article 2.2., Electric Watthour Meters; the American National Standard Code for Electricity Metering, ANSI C12.1-2001 edition; American National Standard for Electricity Metering, ANSI C12.10-1997 edition for watthour meters. These new requirements provide for safe and accurate metering installations for installers, users, and inspectors.

UR.1. Selection Requirements. This section lists the requirements for meter class, suitability of equipment and instrument transformer ratio.

UR.2. Installation Requirements. This section lists the requirements for safety, accessibility, and integrity for on-site testing of mechanical and electronic watthour meter installations.

UR.2.1. Regulation Conflicts. This subsection states if 4027.5 UR.2. Installation Requirements is less stringent than a similar installation by the serving utility then the installation is subject to the serving utility requirements.

UR.2.2. Meter Test Facilities. This subsection states the meter test facilities shall be the same as required by the serving utility.

UR.2.3. (MM) Test Blocks. This subsection states three-phase self-contained meters shall be equipped with test blocks approved by the serving utility for safe meter testing.

UR.2.4. (MM) Test Switches. This subsection states meters with current or potential transformers or both shall have test switches which are approved by the serving utility for safe meter testing.

UR.2.5. (MM) Circuit Closing Device. This subsection states self-contained meter installations that cannot accept a short interruption of the electrical service, for the purpose of testing, shall be equipped with a manual circuit closing device as approved by the serving utility. It also states automatic circuit closing devices shall not be used on any meter installation.

UR.2.6. Thermal Overload Protectors. This subsection states the main circuit breaker or main switch, fuses, and their auxiliary equipment shall be installed in the load service near its entrance as supplied to the tenant. The intent is to constitute the main control and means of cut-off for the supply to the tenant.

UR.2.7. Metering System Grounds. This subsection states a metal cased meter and its corresponding thermal overload protector enclosure shall be properly grounded.

UR.2.8. Line Service at Test Site. This section states line voltage(s) and neutral shall be readily available and accessible at the field test site for the purpose of energizing test equipment.

UR.2.9. Location of Meter. This subsection describes unobstructed entrance or passageway requirements to allow for installation, reading of the meter, connecting test equipment, and testing of the meter.

UR.2.10. Accessibility. These subsections specify the requirements for meter component heights and meter component access.

> **UR.2.10.1. Meter and Meter Component Heights.** This subsection describes meter and meter component installation height requirements.
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> **UR.2.10.2. Meter Component Access.** This subsection states meter component(s) necessary to conduct a field test be installed so they are readily accessible for testing.
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> **UR.2.10.3. Exemption.** This exemption subsection recognizes the uniqueness of marinas. To avoid possible damage from boat bows and unpredictable movement, meters in marinas are usually mounted below the accepted minimum, in protective enclosures.

UR.2.11. Metered Circuits (Load Service). This subsection states electricity used by the tenant shall be taken exclusively from the load service of the tenant, accurately measure the load, and be capable of being used only at the discretion of the tenant.

UR.2.12. Unmetered Circuits (Line Service). This subsection states the tenants electrical circuit shall not be taken from the line terminals of the meter, meter socket, or line service. It also states the owner of the submeter system may utilize this service.

UR.2.13. Dedicated Tenant Service. This subsection states a meter shall serve only the space, lot, building, room, suite, stall, slip, or premise occupied by the tenant.

UR.2.14. Tenant Premise Identification. This subsection states the tenant premise shall be clearly and permanently shown on or at the meter, and on all separate components of a meter system, including, but not limited to instrument transformer(s), modem(s), and transmitter(s) if equipped. Also remote indications and all printed indications shall be readily identifiable and associated with the tenant's premise. Printed indications shall also include time and date information.

Estimated Cost or Savings to Public Agencies or Affected Private Individuals or Entities

The Department of Food and Agriculture has initially determined that this proposal does not impose a mandate on local agencies or school districts.

The Department has also initially determined that no savings or increased costs to any State agency, no reimbursable costs or savings under Part 7 (commencing with Section 17500) of *Division 8* of the Government Code to local agencies or school districts, no nondiscretionary costs or savings to local agencies or school districts, and no costs or savings in federal funding to the State will result from this action.

The cost impact of the changes in the regulations on private persons or businesses is expected to be insignificant.

The Department has initially determined that the proposed action will not have a significant adverse economic impact on housing costs or businesses, including the ability of California businesses to compete with businesses in other states. The Department's initial determination that this action will not have a significant adverse economic impact is based on the fact that this regulation does not place new requirements or restrictions on businesses.

Assessment

The Department has made an assessment that the proposed regulation sections would not: (1) create or eliminate jobs within California; (2) create new business or eliminate existing businesses within California; and (3) affect the expansion of businesses currently doing business in California.

Alternative Considered

The Department must determine that no alternatives considered would be as effective in carrying out the purpose of this proposed regulation or would be as effective and less burdensome to the affected private persons other than the proposed regulation.
This regulatory action has no significant adverse economic effect on businesses.

Technical Theoretical and/or Empirical Study, Reports, or Documents

The Department has relied on the following for these regulation amendments:

California Code of Regulations, Title 4, Division 9, Chapter 1, Article 2.2. Electric Watthour Meters.

American National Standard for Electricity Metering, ANSI C12.1- 2001

American National Standard for Electricity Metering, ANSI C12.10-1997

National Electrical Manufactures Association, NEMA EI 21.1-1993

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